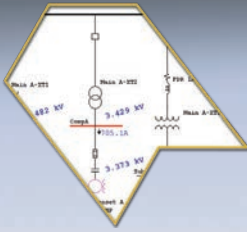




ETAP is the most comprehensive analysis platform for the design, simulation, operation, and automation of generation, distribution, and industrial power systems. ETAP is developed under an established quality assurance program and is used worldwide as a high impact software. ETAP is completely localized in four languages with translated output reports in six languages.

As a fully integrated enterprise solution, ETAP extends to a Real-Time Intelligent Power Management System to monitor, control, automate, simulate, and optimize the operation of power systems.

Product Overview



Network Analysis

Short Circuit - ANSI / IEEE

- ANSI / IEEE C37 Standards
- IEEE 141 & 399 Standards
- UL® 489 Standard
- Integrates with protective device coordination
- Automatic device evaluation for 3-phase, 1-phase, & panel systems
- Generator CB evaluation
- Phase-shifting transformer
- Load terminal short circuit calculation

Short Circuit - IEC

- IEC 60909, 60282, 60781, & 60947 Standards
- Transient fault analysis - IEC 61363 Standard
- Integrates with protective device coordination
- Automatic device evaluation for 3-phase, 1-phase, & panel systems
- User-definable voltage c factor
- Load terminal short circuit calculation

Load Flow

- Power flow
- Demand load
- Voltage drop
- Power factor correction
- Automatic device evaluation
- Automatic temperature correction
- 2W & 3W transformer LTC / regulator actions
- Real & reactive power losses
- Extensive violation alerts
- Multi-report result analyzer
- Auto-Run load flow based on system changes

Motor Acceleration

- Dynamic motor acceleration
- Voltage flicker
- Motor & load dynamic models
- Static motor starting
- Multi-sequence starting
- Conventional starting devices
- Soft starter devices
- VFD frequency control motor starting
- Load & generation transitioning
- Motor Operated Valve (MOV) simulation
- Comprehensive alarm & warning



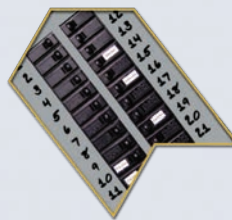
Arc Flash

AC Arc Flash

- IEEE 1584 2002 & 2004 Standards
- NFPA® 70E 2000, 2004, & 2009 Standards
- CSA Z462 2008 Standard
- ASTM D 120-02a Standard
- OSHA 29 CFR 1910 Standard
- National Electric Code® (NEC) 110.6
- National Electric Safety Code® (NECS)
- Embedded short circuit & device coordination
- Primary protective device identified
- Current Limiting Fuse (CLF) modeling
- Incident Energy plots
- LV transformer arc flash limit
- Maintenance mode switch
- Relay actions (49, 50, 51, 67, 79, 87)
- Panels & single-phase systems
- Multi-report Result Analyzer
- Labels, work permits, & data sheets

DC Arc Flash

- Maximum Power Method
- Stokes & Oppenlander Method
- Paukert Method
- Determine incident energy
- Assess arc flash protection boundary
- Create DC arc flash labels
- DC arc flash reports from Result Analyzer



Panel Systems

Panel ANSI & IEC

- Intelligent panel design & analysis
- 3-phase (3W & 4W) panels
- 1-phase (2W & 3W) panels
- 1-phase (A, B, C, AB, BC, CA, & 3W) panels
- ANSI & IEC Standards
- NEC load factors
- Load flow with graphical per phase display
- Automatic device duty evaluation & alerts
- Automatic updating of upstream panels
- Export panel schedules to Microsoft Excel
- Panel with internal & external feeders & loads



Protective Devices

Coordination & Selectivity

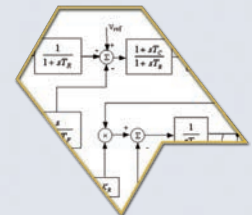
- AC & DC coordination
- Graphically adjustable device settings
- Extensive device library (verified & validated)
- Embedded short circuit analysis
- Embedded motor acceleration analysis
- Multi-axis time current curves
- Comprehensive plot options
- Adjustable magnifying-glass zoom view
- Time difference calculator
- Multi-function / level relays
- Device setting reports
- Automatic detection of protection zones
- Protection & coordination zone viewer

Sequence-of-Operation

- View device operation sequence graphically
- Device failure & backup operation
- Sequence viewer
- Normalized (shifted) curves
- Current summation
- Relay actions (27, 49, 50, 51, 51V, 59, 67, 79, 87)

Relay Test Set Interface

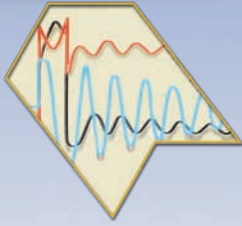
- Interfaces with testing & maintenance database
- Export short circuit & protective relay settings
- Plot device steady-state response
- Compare relay response with OEM data
- Display relay actual transient response
- Analyze relay false trips & mis-operation
- Export to COMTRADE format



User-Defined Dynamic Model

- Full graphical model builder
- Library of pre-built models
- Integrated with transient stability models
- Wide variety of blocks for building models
- Import & Export Simulink® models
- Various model testing methods
- Real-time compiling & linking of model
- Automatic UDM links to components
- Compile & test directly from the UDM builder

Intuitive



Dynamics & Transients

Transient Stability

- Complete synchronous & induction machine models
- Comprehensive excitation system models
- Comprehensive governor-turbine models
- Power System Stabilizer (PSS) models
- GE, Westinghouse, & Solar gas turbines
- User-Defined Dynamic Models (UDM)
- Unlimited sequence of events & actions
- Typical & common disturbances & operations
- Automatic actions based on relay settings
- Short-time & long-time simulation
- Variable total simulation time & simulation step
- 3-phase & line-to-ground fault actions
- Auto-sync check action
- Embedded Newton-Raphson initial load flow
- VFD dynamic modeling
- Lumped Load user-defined dynamic modeling
- UPS parallel operation modeling
- PV Array source modeling
- Inverter source modeling

Generator Start-Up

- Cold-state generator starting
- Load generators prior to synchronous speed
- Frequency-dependent machine models
- Frequency-dependent network models
- An expansion to the Transient Stability module
- User-defined dynamic model interface



Transformer

MVA Sizing

- Sizing based on actual connected or operating load
- ANSI & IEC standard types, classes, & ratings
- Considers ambient temperature, altitude, load growth, & load factors
- MVA Sizing based on cooling stages

Tap Optimization

- ANSI / IEEE C57.116 Standard
- Optimize unit transformer turns ratio
- Considers system voltage variation
- Considers generation station auxiliary load
- Generator reactive capacity vs. voltage plots



Renewable Energy

Wind Turbine Generator

- Model unlimited wind turbine generators
- Detailed modeling of turbine dynamics, aerodynamics, & power coefficients
- DFIG with pitch & converter controller
- Simulate wind disturbance like ramp & gust
- Individual or zone-based disturbances
- WECC wind turbine models

Photovoltaic Array

- Performance adjustment coefficients
- Solar farm modeling
- Solar irradiance based on location & time
- AC & DC System Analysis
- Inverter dynamic modeling & operation modes
- Maximum Peak Power Tracking (MPPT)
- Extensive Manufacturer/Model library
- P-V & I-V curves



Cable Systems

Underground Thermal Analysis

- Neher-McGrath Method
- IEC 60287 Standard
- Steady-state temperature
- Ampacity optimization
- Automatic cable sizing
- Transient temperature
- Intelligent rule-based alignment & spacing tools
- Automatic conduit distribution & spacing
- Uniform & non-uniform conduit arrangements
- Custom, NEC, or IEEE rule-based spacing
- Wizard for creating raceways

Cable Pulling

- Integrated with one-line diagram cables
- Integrated with underground raceways cables
- Pull multiple cables
- Completely flexible pull geometry
- Full ETAP cable library integration
- Display 3-D pulling path geometry



Cable Sizing

Ampacity & Sizing

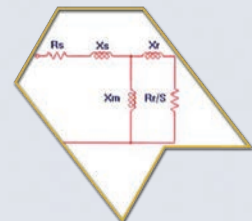
- IEEE 399 Standard
- NFPA 70 - National Electric Code
- ICEA P54 Standard
- IEC 60364-5-52, 60364-4-43 Standards
- BS 7671 Standard
- Ampacity / Current Carrying Capacity Calculator
- Sizing based on ampacity, voltage drop, short circuit, harmonics, & overload protection
- Maximum or average operating current
- Grounding conductor selection based on NEC
- Cable Library with neutral, grounding/ protective earthing (PE) conductor
- Add auxiliary neutral & PE conductors
- Optimal & alternative sizes
- Model Forms: BS & user-definable
- Reports in Crystal Reports & Excel

Protective Earthing (PE) Conductor Sizing

- IEC 60364-5-54 Standard
- BS 7671 Standard
- PE thermal requirements & sizing
- User-defined fault current & clearing time
- Reports in Crystal Reports & Excel
- Consider leakage current

Electric Shock Protection

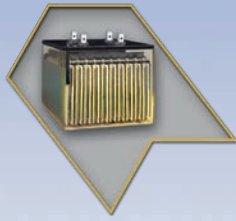
- IEC 60364-4-41 Standard
- BS 7671 Standard
- EN 50122 Standard
- TN-C, TN-S, TN-C-S, TT, & IT Earthing types
- Electric shock requirements
- Loop impedance & current calculation
- Touch voltage calculation & evaluation
- Consider resistance to Ground / Earth
- GFCI / RCCB protection
- Reports in Crystal Reports & Excel



Parameter Estimation

- Estimate induction machine equivalent circuit parameters based on readily available manufacturer data
- Single-cage models
- Rotor deep-bar effects

Integrated



DC Systems

Load Flow

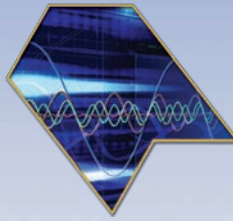
- IEEE 946 Standard
- Integrated AC & DC systems
- Embedded Newton-Raphson Method
- Voltage drop
- Power losses
- Battery auto-activation
- Charger / UPS current limit
- Charger / UPS mode auto-switching
- DC converter modeling
- Motor model auto-switching

Short Circuit

- IEEE 946 Standard
- Integrated AC & DC systems
- Total bus & branch contribution fault currents
- Fault current rising time
- Battery modeling per ANSI / IEC Standard
- Charger modeling per ANSI / IEC Standard

Battery Discharge & Sizing

- IEEE 308, 485, & 946 Standards
- Integrated AC, DC, & Control System Diagram
- Battery discharge simulation
- Battery sizing
- Discharge via DC load flow or duty cycle summation
- Voltage drop & loss consideration
- Class 1E DC power & control system models
- Simulation of control system with battery discharge voltage
- Duty cycle diversity factor
- Load model type per operating characteristics
- Battery duty cycle calculated from individual loads
- Options for battery & load duty cycle 1 minute span
- Multiple user selected options for battery characteristic interpolation
- Multiple diversity & correction factors
- Battery sizing report in IEEE 485 Standard format
- Plot battery capacity, voltage, & current
- Plot bus voltage & load & branch flow
- Detailed battery library



Power Quality

Harmonic Load Flow

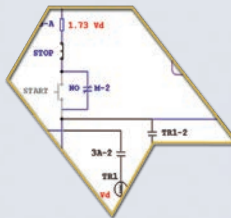
- IEEE 519 Standard
- Automatic distortion evaluation (THD & IHD)
- Telephone influence factors (TIF & I*T)
- Calculate & report I*TB (Balanced) & I*TR (Residual)
- VFD harmonic modeling
- UPS AC input & output modeling for harmonic orders
- PV Array modeling for harmonic orders
- Automatic alerts of violations
- Harmonic sources library
- Embedded Newton-Raphson Method
- Embedded Accelerated Gauss-Seidel Method

Frequency Scan

- User-definable frequency range
- Identify resonance conditions
- User-customizable plots

Harmonic Filters

- Filter design & sizing
- Single-tuned, high-pass, & band-pass filters
- Automatic filter overloading alert
- Inter-harmonic filter modeling



Control Systems

DC Control Systems Diagram

- Simulation of operation sequence
- Pickup & dropout voltage calculation
- Automatic alerts
- Burden & inrush modes
- Controlled contacts
- Integrated with battery discharge calculation
- Integrated with one-line diagram
- State engine with automatic & step-by-step sequence of operation of control relays, switching actions, etc.



Data Exchange

DataX

- Import & export data
- Data synchronization
- Automatic one-line diagram generation
- Intelligent error checking
- Customizable data mapping
- Real-time data exchange
- RAW data / IEEE format
- Load Ticket for induction machines

Microsoft® Excel Interface

- Bi-directional Excel data exchange (Open & Fixed Formats)
- Map Excel worksheets to ETAP elements
- Synchronize data to ETAP projects
- Perform consistency checks during data exchange
- Substitute missing information with ETAP defaults & library data

Project Merge

- Multi-user management of project merge
- Parallel ETAP project development
- Self contained snapshots of the parent & branch projects
- Merge Base & Revision Data

SmartPlant® Electrical Interface

- Bi-directional data exchange
- Map attributes of SPEL with ETAP elements
- Database mapping via graphic user interface

e-DPP® Interface

- Map attributes of e-DPP to ETAP elements
- Synchronize e-DPP data to ETAP projects
- Database mapping via graphic user interface

CAD Interface

- Export one-line diagrams in DXF format
- Import ground grid plans from AutoCAD



Distribution Systems

Unbalanced Load Flow

- Unbalanced power flow
- Single-phase & unbalanced 3-phase modeling
- Unbalanced & nonlinear load modeling
- Open-Delta transformer modeling
- Center-Tap transformer modeling
- Three 1-phase transformer modeling
- Isolated sub-systems with voltage-control source modeling
- Isolated 1-phase source & system modeling
- Phase & sequence voltage, current, & power
- Voltage & current unbalance factors
- Transmission line coupling
- Automatic device evaluation
- Report voltage & power in multi-units

Optimal Power Flow

- Solve multiple objectives simultaneously
- Interior point method with barrier functions
- Minimize power losses
- Active power optimization
- Reactive power optimization
- Optimal dispatch

Optimal Capacitor Placement

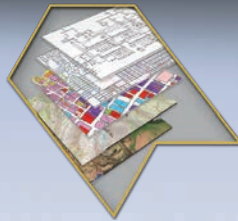
- Optimal location & bank size
- Minimize installation & operation costs
- Individual source or average energy cost
- Voltage & power factor objectives
- Minimum, maximum, & average loading
- Branch capacity release & cost savings
- Review capacitor impact on the system
- Capacitor control method
- Flexible constraints

Reliability Assessment

- System reliability
- Customer oriented indices
- Energy (cost) indices
- Sensitivity analysis
- Single & double contingency

Single-Phase Distribution

- ANSI & IEC Standards
- Load flow with graphical per phase display
- Voltage drop & power losses
- Voltage & current unbalance factors
- Automatic device duty evaluation & alerts



Geographic Information System

GIS Map

- View GIS maps in ETAP
- Display analysis results on GIS maps
- Synchronize GIS data to ETAP projects
- Use graphical user interface for data mapping
- Control modification & accept / reject actions
- Check consistency for data synchronization
- Utilize GIS map tools
- GIS handling of 1-phase systems



Ground Grid Systems

Finite Element Method

- 3-D plots for step, touch, & absolute potentials
- 3-D irregular configurations
- 3-D graphical interface views
- Rods & conductors in any direction
- Graphical display of over limits

IEEE 80 & 665 Standards

- Conductor & rod optimization
- 3-D graphical interface views



Transmission Line

Line Constants

- Conductor & ground wire libraries
- Built-in configurations: horizontal, vertical, etc.
- General configuration: X, Y, & Z coordinates
- Multi-line mutual coupling
- Phase & sequence impedance matrix
- Transposed & un-transposed lines
- Short & long line models
- Multiple layer soil model
- Calculated or user-defined impedances

Line Ampacity

- Conductor ampacity vs. temperature
- IEEE 738 Standard
- Determine maximum operating temperature for various loading conditions
- Derated ampacity based on temperature limit
- Consider weather, solar heat, & geographical location

Sag & Tension

- Sag / tension vs. temperature
- Multiple spans between dead-end structures
- Level spans of unequal length
- Solve spans of unequal length on different horizontal planes
- Include effects of wind, temperature, & k factor

HVDC Transmission Link

- Detailed rectifier & converter modeling
- Composite AC / DC & DC / AC systems
- Built-in control schemes
- Inclusive transformer model
- Automatic harmonic spectrum calculation
- Easy-to-use integrated model

ETAP Quality Assurance

ETAP's quality assurance is specifically dedicated to meeting the requirements of:

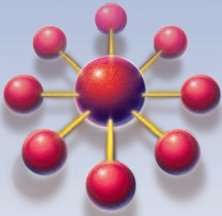
ISO 9001:2008
10 CFR 50 Appendix B
10 CFR 21
ANSI/ASME N45.2
ASME NQA-1
ANSI / IEEE 730.1
CAN / CSA-Q396.1.2
ANSI N45.22

ETAP is Verified and Validated (V&V) against field results, real system measurements, established programs, and hand calculations in order to ensure its technical accuracy. Each release of ETAP undergoes a complete V&V process using thousands of test cases for each and every calculation module and library data.

Certificate
Registration #
10002889 QM08



ETAP is a high impact software qualified for use within nuclear, military and mission critical facilities and operations.



ETAP Base Package is a set of core tools, embedded analysis modules, and engineering libraries that allow you to create, configure, customize, and manage your system model. Core tools allow you to quickly and easily build 3-phase and 1-phase AC and DC network one-line diagrams with unlimited buses and elements including detailed instrumentation and grounding components. Engineering libraries provide complete verified and validated data based on equipment manufacturers' published data.

Embedded Analysis Modules

- Cable Ampacity
- Transformer Sizing
- Cable Sizing
- Transmission Line Constants

One-Line Diagram

- Built-in intelligent graphics
- Network nesting
- Integrated 1-phase, 3-phase, & DC systems
- Integrated AC, DC, & grounding systems
- Multiple generators & grid connections
- Display results on one-line diagrams
- Customizable font types, styles, & colors
- Customizable display of ratings & results
- Graphical display of equipment grounding
- Graphical display of overstressed devices & alerts
- Hide & show protective devices & grounding elements
- Theme manager with standard, voltage, area and grounding / earthing colors
- One-line templates
- Propagation of nominal & rated voltage
- Propagation of phase connection
- Automatic display of energized & de-energized elements using dynamic continuity check
- Text box editor with dynamic link to properties
- OLE object & ActiveX control integration
- Intelligent text box & hyperlink bookmarks
- Customizable output reports via Crystal Reports
- Batch printing with view-dependent printer settings
- User-friendly plotting
- Keyword based element search

One-Line Templates

- Create & utilize unlimited one-line templates
- Share templates created by other ETAP engineers
- Use default project ID or template ID
- Use properties from the default project or templates
- Instant preview of templates

System Elements

- Unlimited AC & DC elements
- 1-phase (2 & 3 W), 2-phase (2 & 3 W), 3-phase (3 & 4 W)
- Unlimited buses: license dependent at run-time
- Nested views (composite networks & MCC)
- Power grid
- Synchronous & induction generators
- Photovoltaic Array
- Wind Turbine Generator
- MOV, synchronous, & induction motors
- Exciters, governors, & stabilizers
- Voltage & frequency dependent lumped load
- Cable, line, reactor, & impedance branches
- 2W & 3W transformers with voltage regulators
- Open-Delta transformer
- Remote connectors
- Harmonic filter & Static Var Compensator
- Instrument transformers
- Protective devices & meters
- Single & double throw switches
- Grounding switch
- Bus duct
- Batteries, DC motors, DC loads & branches
- Chargers
- Inverters
- UPS
- DC converter
- Variable Frequency Drive (VFD)
- ANSI, IEC, & user-defined symbols

Configuration Manager

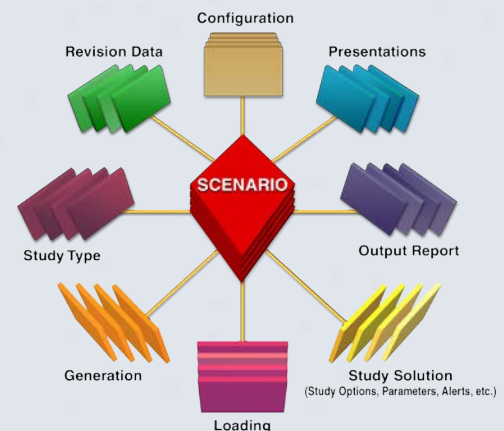
- Tabulate & control different status configurations
- Compare source, load, & switching device status
- Flag changed data with checker capability
- Copy, merge, export, import, & print

Data Manager

- View / edit Base & Revision Data
- View equipment properties for individual fields
- View State & Service
- View absolute value or differences
- Display & filter study data
- Graphical data management and merge per individual equipment

Theme Manager

- Display color coding based on:
 - Standard
 - Voltage level
 - Area
 - Grounding (Solid, Low-Z, High-Z, Ungrounded)
 - Earthing (TT, TN, IT, NEC)
 - Grounding by ground switch
- Display faulted buses by symbol or color



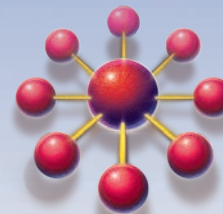
Multi-Dimensional Database

- Orthogonal multi-dimension database
- Unlimited independent graphical views
- Unlimited status configurations
- Unlimited property revisions
- Multiple loading & generation conditions
- Lock & unlock element properties
- 10 States to track equipment conditions
- Local SQL server connectivity
- Utilize real-time operating data
- Unlimited study solutions
- ODBC – Microsoft Access, SQL Server
- Dumpster with unlimited cells: copy & paste
- User access security with password protection
- Edited-by & checked-by with date stamping
- Merge project files via clipboard
- Collaborate on ETAP projects using Project Merge

Base Package

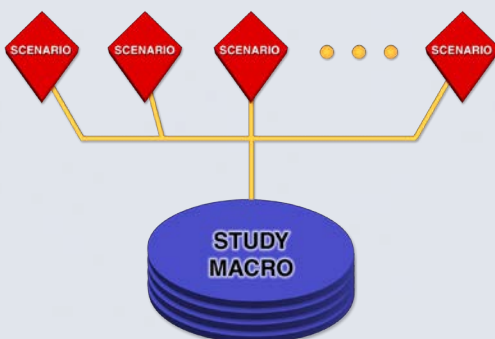


Base Package includes an intelligent one-line diagram, element editors, configuration manager, report manager, project and study wizards, multi-dimensional database, theme manager, data exchange, and user access management. Embedded analysis modules, such as Cable Ampacity, Cable Sizing, and Transmission Line Constants, provide integrated as well as stand-alone capabilities to design, analyze, and size equipment.



Project Management Wizards

- Manage studies with scenarios & macros
- Record scenarios based on study settings
- Macro-controlled scenario execution



Network Simulation

- Unlimited buses (license dependent) & elements
- Looped & radial systems
- Automatic error checking
- User interface for all network analysis modules
- Customizable ETAP preference properties
- Multi-level user access management

Built-In Calculators

- MVA, MW, Mvar, kV, Amp, & PF conversion
- Motor nameplate & dynamic parameter data
- Generation nameplate
- Power grid short circuit impedances
- Motor & generation inertia

Output Report Comparator

- Built-in output report comparison tool
- Compare hundreds of study reports in one action
- Verify study results against benchmark reports

Data Exchange

- WMF / EMF / DXF / PDF exporting
- Import RAW / IEEE / CSV files
- Export one-line diagrams in DXF format
- Import ground grid plans from AutoCAD®
- Load Ticket for induction machines

Libraries

- Comprehensive library: ANSI & IEC devices
- Verified & Validated (V&V) library data
- V&V locked data
- Add, copy, merge, & delete capabilities
- User-defined & controlled libraries
- User-access control & security
- Edited-by & checked-by with date stamping
- User-controlled library merge

Report Manager

- Customizable output reports & plots
- Input, results, alerts, & summary reports
- Reports via Crystal Reports viewer
- PDF, Microsoft® Word, Access, & Excel reports
- Element ID & text search capability
- Multi-Language Report

Multiple Language Support

- Interface & Help File in four languages
- Output reports in six languages



	Localized Release	Output Reports In Every Release
English	✓	✓
Spanish	✓	✓
Chinese	✓	✓
Japanese	✓	✓
Portuguese		✓
German		✓

Libraries

- Cable
- Cable Fire Coating Protection
- Cable Fire Stop Protection
- Cable Fire Wrap Protection
- Transmission Line
- Line Ground Conductor
- Motor Nameplate
- Motor CKT Model
- Motor Characteristic Model
- Motor Load Model
- Wind Turbine Generator
- Photovoltaic Panel
- Solar Panel
- Fuse
- Recloser Hydraulic
- Recloser Electronic Controller
- HV Circuit Breaker
- LV Circuit Breaker
- Solid State Trip
- Thermal Magnetic
- Electro-Magnetic
- Motor Circuit Protector
- Overload Heater
- Harmonic
- Interruption Cost
- Reliability
- Battery
- Control Contact
- Control Relay
- Control Solenoid
- GFI / RCD

Download a Free Demo at etap.com

ETAP Real-Time



Monitoring & Predictive Simulation

Advanced Monitoring

- Network Topology Builder & Processor
- Intelligent graphical user interface
- State estimator & load distributor
- Process & performance monitoring
- Alarm & notification management
- Generation reserve monitoring
- Multi-state breaker monitoring & control
- Thin client application for monitoring & control
- Customizable Web-based interfaces & technology
- Human Machine Interface (HMI) template library
- Web-based customizable HMI

Energy Accounting

- Energy tariff builder
- Customizable reports
- Real-time energy cost tracker
- Cost & consumption summary

Real-Time Simulation

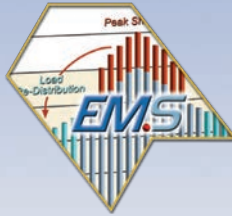
- Simulate circuit breaker operation
- Identify potential operating problems
- Simulate motor starting & load change
- Predict operating time of protective devices
- Predict system response based on operator actions
- Perform "What If" operating scenarios
- Simulate real-time & archived data
- Operator assistance & training

Event Playback

- Replay archived historian data
- Investigate cause & effect
- Explore alternative actions
- Replay "What If" scenarios
- Playback of event views
- Historical alarm database

Load Forecasting

- Adaptive bus load forecasting
- Real-time trending
- Load profile library
- Forecasting scenario archiving



Energy Management System

Automatic Generation Control

- Multi-area control
- Load frequency control
- MW & MVAR sharing
- NERC performance standard

Economic Dispatch

- Minimize fuel costs
- Optimize energy costs
- Fast solution
- Robust algorithms

Supervisory Control

- System optimization
- Supervisory & advisory control system
- Optimal power flow
- Programmable logic editor

Interchange Scheduling

- Tariff analyzer
- Rate structure builder
- Transaction scheduling
- Transaction contract
- Transaction reports
- Fuel cost schedule reports

Reserve Management

- Operating reserve analysis
- Reserve capacity monitoring
- Notification of inadequate reserve
- Predict operating reserve

Information Storage & Retrieval

- SQL Server-based data archiving
- Energy, power & nonelectrical data tracking
- Automatic data handling & management
- Export to MS Excel
- Customizable Reports



Intelligent Substation

Substation Automation

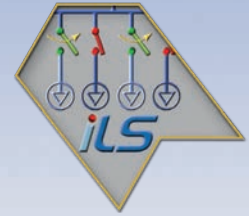
- Flexible automation
- Programmable logic editor
- Online control
- Remote control - enable & disable commands
- Control inhibition based on system operational constraints

Switching Management

- Switching sequence management
- Safety & security procedures
- Interlock logic evaluator
- Switching plan validation
- Control inhibition based on switching operations
- Safety ground switch
- Pre-switch & post-action interlock
- Enforced interlock logic in simulation mode
- Integrated operation with Switching Management System
- Supervisory control for real-time switching operation

Load Management

- Demand-side management
- Time-of-use load shifting
- Intelligent load management



Intelligent Load Shedding

Load Preservation

- Steady-state & transient response
- Optimal load preservation
- Fast response time
- Reliable operation
- Minimum load shedding
- Proactive contingency analysis
- System islanding logic
- VFD load reduction control

System Restoration

- Restart inhibition
- Logical load sequencer
- Load / source restoration priority

Load Shedding Validation

- Automatic generation of transient study cases
- Confirm load shedding actions
- Simulate ILS recommendation
- Integrated stability knowledge base

Real-Time Solutions

- Power Management System
- Energy Management System
- Generation Management System
- Distribution Management System
- Intelligent Load Shedding
- Smart Grid & Microgrid Solutions



etap.com

 OPERATION TECHNOLOGY, INC.
(800) 477-ETAP • (949) 900-1000

B8-PO-E11-0911-15

© 2011 Operation Technology, Inc. All rights reserved. Certain names and/or logos used in this document may constitute trademarks, service marks, or trade names of Operation Technology, Inc. Other brand and product names are trademarks of their respective holders.